PROJECT NUMBER: 2307
PROJECT TITLE: Flavor Investigation/Nonvolatile Flavor Investigation/Processed Tobacco
PROJECT LEADER: W. R. Raymond
PERIOD COVERED: April, 1988

I. FLAVOR INVESTIGATION:

A. Objective:

To provide analytical support for activities related to development and application of flavoring materials.

B. Results:

1. Project Grain--Repeat analyses of ethanol and multidimensional GC analyses of two major volatile constituents were completed for control versus sonulated A/C formulations with 30% and 100% ethanol replacement levels. Analytical ethanol values were consistent with formulae levels. However, significant differences in the two volatile components were observed among samples.

2. Marlboro POL's--Complete flavor analyses (A/C's, A/C concentrates and casings) were performed for POL 3584 and 3585 production runs at Stockton Street on 4/18/88. Also determined were A/C levels on filler. Analytical results indicated conformation to formula specifications and correct A/C application levels.

3. Menthol--A time study was completed to monitor residual ethanol levels in foil- vs spray-mentholated production cigarettes of known history. Two analytical methods, an extraction method and a headspace GC method, were used in parallel and a strong correlation established between the two. The residual ethanol level in B&H Menthol (spray application) cigarettes was ca. 200 µg/cigarette initially and exhibited negligible change through four weeks of ambient temperature storage. Of three foil-mentholated packings studied, all had initial ethanol levels in excess of 1000 µg/cigarette, two exhibited only ca. 20% decreases in ethanol after the fourth week of storage and the third, MFLM 100's FTB, exhibited a ca. 70% decrease during the same period. The need for further studies is indicated.

4. TRIM--Complete analyses were performed on TRIM flavors and casings. With the exception of the PG level in the Burley spray, all values were within specified ranges. Samples of two proposed production tipping adhesives for TRIM were analyzed by headspace GC to try to determine possible causes for subjective differences. No major volatile solvent differences were noted.

5. Analytical Method Development--A new GC procedure was developed to quantitatively monitor volatile components in Burley top casing for specification and Q.A. purposes. A Q.A.

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procedure was prepared for "Determination of Glucose, Fructose, Sucrose and Glycerin in Flavor Materials by HPLC."

6. Applied Flavor Investigation--Based on frequent encounters with acetal formation in PM flavor systems, PG and glycerin acetals of eight commonly-used aldehydes were prepared and analyzed by GC and GC/MS to obtain retention data and reference spectra.

7. Miscellaneous--GC profiles for Merit and Half-Pint A/C's were determined and compared to prior profiles. Two revision flavors were compared by GC versus prerevision retain samples and purities were determined for two flavor chemicals. Headspace GC/MS analyses were performed on several samples of packaging materials including two types of promotional sleeves with U.V. cured printing inks.

II. NONVOLATILE FLAVOR INVESTIGATION:

A. **Objective**: To investigate tobacco-natural, tobacco-identical and other nonvolatile fractions and constituents for potential application as cigarette flavor additives.

B. **Results**:

Samples of subcuts from Bright tobacco extract carbon fractions III and IV were received from S. Tafur for subjective evaluation. Evaluation is in progress.

III. PROCESSED TOBACCO:

A. **Objective**: To develop basic and applied knowledge for the purpose of improvement or selective modification of subjective properties of processed tobaccos.

B. **Results**:

1. RLB--Modified dry flavor replacement samples were requested from one supplier for analytical and subjective comparisons with material originally submitted.

2. ART-Stem--Post-ART CRS from trials 96-101 is being evaluated for direct utilization in Marlboro and PMSL. Subjective testing of post ART IS vs. IS, both at 5% in MF, indicated a tendency toward reduced liking scores for the test IS. In PMSL, the control IS also had higher liking scores. In MF, the test IS was perceived as dryer, more dirty and earthy. In PMSL, the control was perceived as smoother, less hot and less peppery then the post ART material.

3. Stems--Marlboro cigarettes containing cased IS versus ES have been submitted for analytical and subjective comparisons prior to release for POL tests.

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